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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/073,699	02/11/2002	James Nicholas LaPrade	YR1-3 / 300P010064-US (PA)	4400
2512	7590	08/12/2004	EXAMINER GANTT, ALAN T	
PERMAN & GREEN 425 POST ROAD FAIRFIELD, CT 06824			ART UNIT 2684	PAPER NUMBER

DATE MAILED: 08/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/073,699

Applicant(s)

LAPRADE ET AL.

Examiner

Alan T. Gantt

Art Unit

2684

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 9, 10, and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Draim et al.

Regarding claim 1, Draim discloses a satellite communication system that consists of a constellation of non-geostationary satellites that communicate with ground stations using high frequency communications. Since Draim meets communicates with earth ground stations it meets the following limitations for a broadband communication system comprising:

a first broadband communication ground station; (paragraphs 0124 and 0137-the services discussed are inherently broadband)

a second broadband communication ground station; (paragraph 0124)

a satellite constellation for conducting bidirectional broadband communication between the first broadband communication ground station and the second broadband communication ground station, at least one satellite of the satellite constellation having

an inclined eccentric orbit in a first orbit plane; (paragraph 0126 and 0137 – communication is considered bi-directional as opposed to broadcast and the services provided are broadband services)

wherein the satellite constellation is disposed in orbit so that when observed from a predetermined ground observation point a number of satellites, including the at least one satellite, in the satellite constellation appear to follow a substantially common path which extends through a predetermined active zone, the number of satellites moving along the common path so that the predetermined active zone has one satellite from the number of satellites continuously located therein; (paragraphs 0084 and 0087 – there is a discussion of a first plurality of satellites having a common ground track) and

wherein the at least one satellite and at least another satellite from the number of satellites are launched into a common initial orbit plane which is different than the first orbit plane. (paragraphs 0084 and 0087 – a first plurality of satellites having a first common ground track, a second plurality of satellites having a second common ground track indicates the second plurality's orbit plane is different from the first plurality)

Regarding claim 2, Draim meets the limitation - The system as in Claim 1, wherein the predetermined active zone is substantially fixed relative to the first broadband communication ground station, and the ground station has an antenna pointed at the predetermined active zone. (paragraph 0168)

Regarding claim 3, Draim meets the limitation - The system as in Claim 1, wherein the first broadband communication ground station is located at the predetermined ground observation point. (paragraph 0168 – “ground station antennas follow what appears to be a single active satellite in a roughly circular closed path . . .”)

Regarding claim 5, Draim meets the limitation - The system as in Claim 1, wherein each satellite in the number of satellites has a different orbit plane, the different orbit planes being arranged to provide an optimal distribution of the number of satellites so that the number of satellites follow the substantially common path with one satellite from the number of satellites always being in the predetermined active zone. (paragraphs 0112 and 0113)

Regarding claim 9, Draim meets the limitation - The system as in Claim 1, wherein the orbit of the at least one satellite has an inclination between about 40° to 70° . (paragraphs 0028, 067, and 106)

Regarding claim 10, Draim meets the limitation - The system as in Claim 1, wherein the orbit of the at least one satellite has an inclination of about 63.4° . (paragraph 0028)

Regarding claim 15, Draim meets the limitation - The system as in Claim 1, wherein the orbit of the at least one satellite has an argument of perigee of 270° (paragraph 0115)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4, 6-8, 11-14, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Draim et al., in view of Cellier.

Regarding claim 7, Draim discloses a satellite communication system that consists of a constellation of non-geostationary satellites that communicate with ground stations using high frequency communications as noted above for claim 1. Although Draim both defines and acknowledges the use of eccentricity values, Draim does not state actual values of this parameter.

Cellier discloses an overhead system of inclined eccentric geo-synchronous satellite orbits having elevation angles greater than a predetermined minimum elevation angle from the horizon.

Cellier meets the following limitation :

wherein the orbit of the at least one satellite has an eccentricity value of about 0.268. (paragraph 0042 and Figure 11)

Regarding claim 8, Cellier shows the use of satellites having eccentricities at about .72 in comparison with satellites within the Molniya system. (Figure 15 and paragraphs 0055 and 0056)

Draim and Cellier are combinable because they share a common endeavor, namely, elliptical satellite constellations that mimic geo-synchronous satellites at higher latitudes. At the time of the applicant's invention, it would have been obvious to modify Draim to provide guidelines for satellite orbits having various and specific eccentricity values as done by Cellier to illustrate constellation performance when different orbit eccentricity values are utilized.

Regarding claims 11 and 12, the examiner takes Official Notice that it is well known to utilize elliptical orbits having apogees in the 4000 km – 5000 km range and that it would have been obvious to modify Draim to include apogees within this range in order provide the timing needed at apogee to approximate the geo-synchronous orbit utilizing a satellite constellation. 47100 km.

Regarding claims 13 and 14, the examiner takes Official Notice that it is well known to utilize different perigee values in a satellite constellation to produce the produce the desired speed for timing purposes at or near the apogee for an individual satellite and that it would have been obvious to modify Draim to include perigee altitudes of the individual satellites to produce the desired placements within the constellation from the vantage point of a ground station.

Regarding claims 4 and 6, the examiner takes Official Notice that it is well to position a spacecraft in a desired orbit by utilizing booster rockets to establish and refine orbits and that it would have been obvious to modify the Draim/Cellier combination to allow for movement of a satellite from an initial orbit to a desired orbital plane as required to meet mission objectives.

Regarding claim 16, Cellier meets the limitation The system as in Claim 1, wherein the predetermined active zone comprises an arc of about 3° centered on an apogee of the orbit of the at least one satellite. (paragraph 0050 – Cellier allows for a desirous operating arc through manipulation of the eccentricity and inclination of the orbit)

Regarding claim 17, Cellier meets the limitation - A broadband communications satellite system as in claim 16 wherein the predetermined active zone is viewable from the northern hemisphere at an elevation angle equal to or exceeding 25° . (paragraph 0049)

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Porcelli et al. discloses a high latitude geo-stationary satellite system employing a constellation of satellites in highly elliptical and highly inclined orbits where the satellites remain almost stationary relative to ground users.

Castiel et al. discloses a fixed satellite constellation system employing non-geostationary satellites in sub-geostationary elliptical orbits with a common ground track.

Any inquiry concerning this communication from the examiner should be addressed to Alan Gantt at telephone number (703) 305-0077. The examiner can normally be reached

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between 9:30 AM and 6 PM within the Eastern Time Zone. The group FAX number is (703) 872-9306.

Any inquiry of a general nature or relating to this application should be directed to the group receptionist at telephone number (703) 305-4700.

Alan T. Gantt

Alan T. Gantt

August 5, 2004

Nick Corsaro

**NICK CORSARO
PATENT EXAMINER**